

WHAT IS CLAIMED IS:

1. A coated endoluminal medical device comprising:  
an expandable structure having an expanded condition and a  
layer of base material having an outer surface, and  
5 a layer of bioactive material sprayed, posited or disposed on the  
outer surface of the base material while the expandable structure was in  
the expanded condition.
2. The coated endoluminal medical device according to claim 1, wherein  
the bioactive material is a lipophilic material.
- 10 3. The coated endoluminal medical device according to claim 1, further  
comprising a hydrophilic material layer posited on and between the base  
material layer and the bioactive material layer.
4. The coated endoluminal medical device according to claim 1, wherein  
the expandable structure includes an inflatable balloon.
- 15 5. The coated endoluminal medical device according to claim 4, wherein  
the expandable structure includes an expandable stent positioned around  
the inflatable balloon.
6. The coated endoluminal medical device according to claim 5, further  
comprising a lipophilic material layer on said balloon extending beyond  
20 ends of the stent disposed around said balloon.
7. A coated endoluminal medical device comprising:  
a layer of base material having at least one of a roughened,  
uneven, unsmooth or textured outer surface, and

a layer of bioactive material sprayed, posited, or disposed on the  
outer surface of the base material.

8. The coated medical device according to claim 7, wherein the bioactive  
material is a lipophilic material.

5 9. The coated medical device according to claim 7, further comprising a  
hydrophilic material layer posited on and between the base material layer  
and the bioactive material layer.

10. A coated medical device comprising:

an inflatable balloon having a base material layer, and a bioactive  
10 material layer posited on said base material layer.

11. The coated material medical device according to claim 10, further  
comprising an implantable stent including a base material layer and a  
bioactive material layer posited thereon, wherein said stent is disposed  
around said balloon.

15 12. The coated medical device according to claim 10, wherein the bioactive  
material layer posited on the stent and the balloon comprises a lipophilic  
bioactive material layer.

13. The coated medical device according to claim 10, wherein the bioactive  
material layer on said balloon comprises a lipophilic material layer and  
20 extends beyond the ends of the stent disposed around said balloon.

14. The medical device according to claim 1, wherein the layer of base  
material of the structure comprises at least one of: stainless steel, tantalum,  
titanium, nitinol, gold, platinum, inconel, iridium, silver, tungsten, or

another biocompatible metal, or alloys of any of these; carbon or carbon fiber; cellulose acetate, cellulose nitrate, silicone, polyethylene terephthalate, polyurethane, polyamide, polyester, polyorthoester, polyanhydride, polyether sulfone, polycarbonate, polypropylene, high  
5 molecular weight polyethylene, polytetrafluoroethylene, or another biocompatible polymeric material, or mixtures or copolymers of these; polylactic acid, polyglycolic acid or copolymers thereof, a polyanhydride, polycaprolactone, polyhydroxybutyrate valerate or another biodegradable polymer, or mixtures or copolymers of these; a protein, an extracellular  
10 matrix component, collagen, fibrin or another biologic agent; or a suitable mixture of any of these.

15. The medical device according to claim 7, wherein the layer of base material comprises at least one of: stainless steel, tantalum, titanium, nitinol, gold, platinum, inconel, iridium, silver, tungsten, or another  
15 biocompatible metal, or alloys of any of these; carbon or carbon fiber; cellulose acetate, cellulose nitrate, silicone, polyethylene terephthalate, polyurethane, polyamide, polyester, polyorthoester, polyanhydride, polyether sulfone, polycarbonate, polypropylene, high molecular weight polyethylene, polytetrafluoroethylene, or another biocompatible polymeric  
20 material, or mixtures or copolymers of these; polylactic acid, polyglycolic acid or copolymers thereof, a polyanhydride, polycaprolactone, polyhydroxybutyrate valerate or another biodegradable polymer, or mixtures or copolymers of these; a protein, an extracellular matrix component, collagen, fibrin or another biologic agent; or a suitable mixture of any of  
25 these.

16. The medical device according to claim 10, wherein the base material layer comprises at least one of: stainless steel, tantalum, titanium, nitinol, gold, platinum, inconel, iridium, silver, tungsten, or another biocompatible

metal, or alloys of any of these; carbon or carbon fiber; cellulose acetate, cellulose nitrate, silicone, polyethylene terephthalate, polyurethane, polyamide, polyester, polyorthoester, polyanhydride, polyether sulfone, polycarbonate, polypropylene, high molecular weight polyethylene,  
5 polytetrafluoroethylene, or another biocompatible polymeric material, or mixtures or copolymers of these; polylactic acid, polyglycolic acid or copolymers thereof, a polyanhydride, polycaprolactone, polyhydroxybutyrate valerate or another biodegradable polymer, or mixtures or copolymers of these; a protein, an extracellular matrix component,  
10 collagen, fibrin or another biologic agent; or a suitable mixture of any of these.

17. The coated medical device according to claim 1, wherein the layer of bioactive material comprises at least one of: paclitaxel, a taxane or other paclitaxel analogue; estrogen or estrogen derivatives; heparin or another  
15 thrombin inhibitor, hirudin, hirulog, argatroban, D-phenylalanyl-L-poly-L-arginyl chloromethyl ketone, or another antithrombogenic agent, or mixtures thereof; urokinase, streptokinase, a tissue plasminogen activator, or another thrombolytic agent, or mixtures thereof; a fibrinolytic agent; a vasospasm inhibitor; a calcium channel blocker, a nitrate, nitric oxide, a  
20 nitric oxide promoter or another vasodilator; an antimicrobial agent or antibiotic; aspirin, ticlopidine or another antiplatelet agent; vascular endothelial growth factor (VEGF) or analogues thereof; colchicine or another antimitotic, or another microtubule inhibitor; cytochalasin or another actin inhibitor; a remodeling inhibitor; deoxyribonucleic acid, an  
25 antisense nucleotide or another agent for molecular genetic intervention; a cell cycle inhibitor (such as the protein product of the retinoblastoma tumor suppressor gene, or analogues thereof); GP IIb/IIIa, GP Ib-IX or another inhibitor or surface glycoprotein receptor; methotrexate or another antimetabolite or antiproliferative agent; an anti-cancer chemotherapeutic

agent; dexamethasone, dexamethasone sodium phosphate,  
dexamethasone acetate or another dexamethasone derivative, or another  
anti-inflammatory steroid; prostaglandin, prostacyclin or analogues thereof;  
an immunosuppressive agent (such as cyclosporine or rapamycin); an  
5 antibiotic (such as streptomycin), erythromycin or vancomycin; dopamine,  
bromocriptine mesylate, pergolide mesylate or another dopamine agonist;  
 $^{60}\text{Co}$ ,  $^{192}\text{Ir}$ ,  $^{32}\text{P}$ ,  $^{111}\text{In}$ ,  $^{90}\text{Y}$ ,  $^{99\text{m}}\text{Tc}$  or another radiotherapeutic agent; iodine-  
containing compounds, barium-containing compounds, gold, tantalum,  
platinum, tungsten or another heavy metal functioning as a radiopaque  
10 agent; a peptide, a protein, an enzyme, an extracellular matrix component,  
a cellular component or another biologic agent; captopril, enalapril or  
another angiotensin converting enzyme (ACE) inhibitor; ascorbic acid,  
alphatocopherol, superoxide dismutase, deferoxamine, a 21-aminosteroid  
(lasaroid) or another free radical scavenger, iron chelator or antioxidant;  
15 angiopeptin; a  $^{14}\text{C}$ -,  $^3\text{H}$ -,  $^{131}\text{I}$ -,  $^{32}\text{P}$ - or  $^{36}\text{S}$ -radiolabelled form or other radio-  
labelled form of any of the foregoing; or a mixture of any of these.

18. The coated medical device according to claim 7, wherein the layer of  
bioactive material comprises at least one of: paclitaxel, a taxane or other  
paclitaxel analogue; estrogen or estrogen derivatives; heparin or another  
20 thrombin inhibitor, hirudin, hirulog, argatroban, D-phenylalanyl-L-poly-L-  
arginyl chloromethyl ketone, or another antithrombogenic agent, or  
mixtures thereof; urokinase, streptokinase, a tissue plasminogen activator,  
or another thrombolytic agent, or mixtures thereof; a fibrinolytic agent; a  
vasospasm inhibitor; a calcium channel blocker, a nitrate, nitric oxide, a  
25 nitric oxide promoter or another vasodilator; an antimicrobial agent or  
antibiotic; aspirin, ticlopidine or another antiplatelet agent; vascular  
endothelial growth factor (VEGF) or analogues thereof; colchicine or  
another antimitotic, or another microtubule inhibitor; cytochalasin or  
another actin inhibitor; a remodeling inhibitor; deoxyribonucleic acid, an

antisense nucleotide or another agent for molecular genetic intervention;  
a cell cycle inhibitor (such as the protein product of the retinoblastoma  
tumor suppressor gene, or analogues thereof); GP IIb/IIIa, GP Ib-IX or  
another inhibitor or surface glycoprotein receptor; methotrexate or another  
5 antimetabolite or antiproliferative agent; an anti-cancer chemotherapeutic  
agent; dexamethasone, dexamethasone sodium phosphate,  
dexamethasone acetate or another dexamethasone derivative, or another  
anti-inflammatory steroid; prostaglandin, prostacyclin or analogues thereof;  
an immunosuppressive agent (such as cyclosporine or rapamycin); an  
10 antibiotic (such as streptomycin), erythromycin or vancomycin; dopamine,  
bromocriptine mesylate, pergolide mesylate or another dopamine agonist;  
 $^{60}\text{Co}$ ,  $^{192}\text{Ir}$ ,  $^{32}\text{P}$ ,  $^{111}\text{In}$ ,  $^{90}\text{Y}$ ,  $^{99\text{m}}\text{Tc}$  or another radiotherapeutic agent; iodine-  
containing compounds, barium-containing compounds, gold, tantalum,  
platinum, tungsten or another heavy metal functioning as a radiopaque  
15 agent; a peptide, a protein, an enzyme, an extracellular matrix component,  
a cellular component or another biologic agent; captopril, enalapril or  
another angiotensin converting enzyme (ACE) inhibitor; ascorbic acid,  
alphatocopherol, superoxide dismutase, deferoxyamine, a 21-aminosteroid  
(lasaroid) or another free radical scavenger, iron chelator or antioxidant;  
20 angiopeptin; a  $^{14}\text{C}$ -,  $^3\text{H}$ -,  $^{131}\text{I}$ -,  $^{32}\text{P}$ - or  $^{36}\text{S}$ -radiolabelled form or other radio-  
labelled form of any of the foregoing; or a mixture of any of these.

19. The coated medical device according to claim 10, wherein the bioactive  
material layer comprises at least one of: paclitaxel, a taxane or other  
paclitaxel analogue; estrogen or estrogen derivatives; heparin or another  
25 thrombin inhibitor, hirudin, hirulog, argatroban, D-phenylalanyl-L-poly-L-  
arginyl chloromethyl ketone, or another antithrombogenic agent, or  
mixtures thereof; urokinase, streptokinase, a tissue plasminogen activator,  
or another thrombolytic agent, or mixtures thereof; a fibrinolytic agent; a  
vasospasm inhibitor; a calcium channel blocker, a nitrate, nitric oxide, a

nitric oxide promoter or another vasodilator; an antimicrobial agent or antibiotic; aspirin, ticlopidine or another antiplatelet agent; vascular endothelial growth factor (VEGF) or analogues thereof; colchicine or another antimitotic, or another microtubule inhibitor; cytochalasin or  
5 another actin inhibitor; a remodeling inhibitor; deoxyribonucleic acid, an antisense nucleotide or another agent for molecular genetic intervention; a cell cycle inhibitor (such as the protein product of the retinoblastoma tumor suppressor gene, or analogues thereof); GP IIb/IIIa, GP Ib-IX or another inhibitor or surface glycoprotein receptor; methotrexate or another  
10 antimetabolite or antiproliferative agent; an anti-cancer chemotherapeutic agent; dexamethasone, dexamethasone sodium phosphate, dexamethasone acetate or another dexamethasone derivative, or another anti-inflammatory steroid; prostaglandin, prostacyclin or analogues thereof; an immunosuppressive agent (such as cyclosporine or rapamycin); an  
15 antibiotic (such as streptomycin), erythromycin or vancomycin; dopamine, bromocriptine mesylate, pergolide mesylate or another dopamine agonist;  $^{60}\text{Co}$ ,  $^{192}\text{Ir}$ ,  $^{32}\text{P}$ ,  $^{111}\text{In}$ ,  $^{90}\text{Y}$ ,  $^{99\text{m}}\text{Tc}$  or another radiotherapeutic agent; iodine-containing compounds, barium-containing compounds, gold, tantalum, platinum, tungsten or another heavy metal functioning as a radiopaque  
20 agent; a peptide, a protein, an enzyme, an extracellular matrix component, a cellular component or another biologic agent; captopril, enalapril or another angiotensin converting enzyme (ACE) inhibitor; ascorbic acid, alphotocopherol, superoxide dismutase, deferoxamine, a 21-aminosteroid (lasaroid) or another free radical scavenger, iron chelator or antioxidant;  
25 angiopeptin; a  $^{14}\text{C}$ -,  $^3\text{H}$ -,  $^{131}\text{I}$ -,  $^{32}\text{P}$ - or  $^{36}\text{S}$ -radiolabelled form or other radio-labeled form of any of the foregoing; or a mixture of any of these.

20. The coated medical device of claim 10, wherein said base material comprises at least one of a group consisting of polyamid, polyethylene, PEBAX or irradiated polyethylene.